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(54) Camera

(57) In a camera of the type in which film is wound between a cartridge and a spool, the cartridge being loaded by opening of the rear wall of the camera, film is first wound continuously without exposure from the cartridge to the spool and is then wound stepwise with exposure from the spool to the cartridge (as opposed to the usual arrangement in which stepwise winding precedes continuous winding). In this manner should the loaded camera be opened inadvertently only a non-exposed region of the film will be spoilt. A camera housing 25 has film cartridge chamber 27 associated with stepwise film advance lever 35, film being first wound from a cartridge to spool 30 using winder 20 and depressing shaft 36.

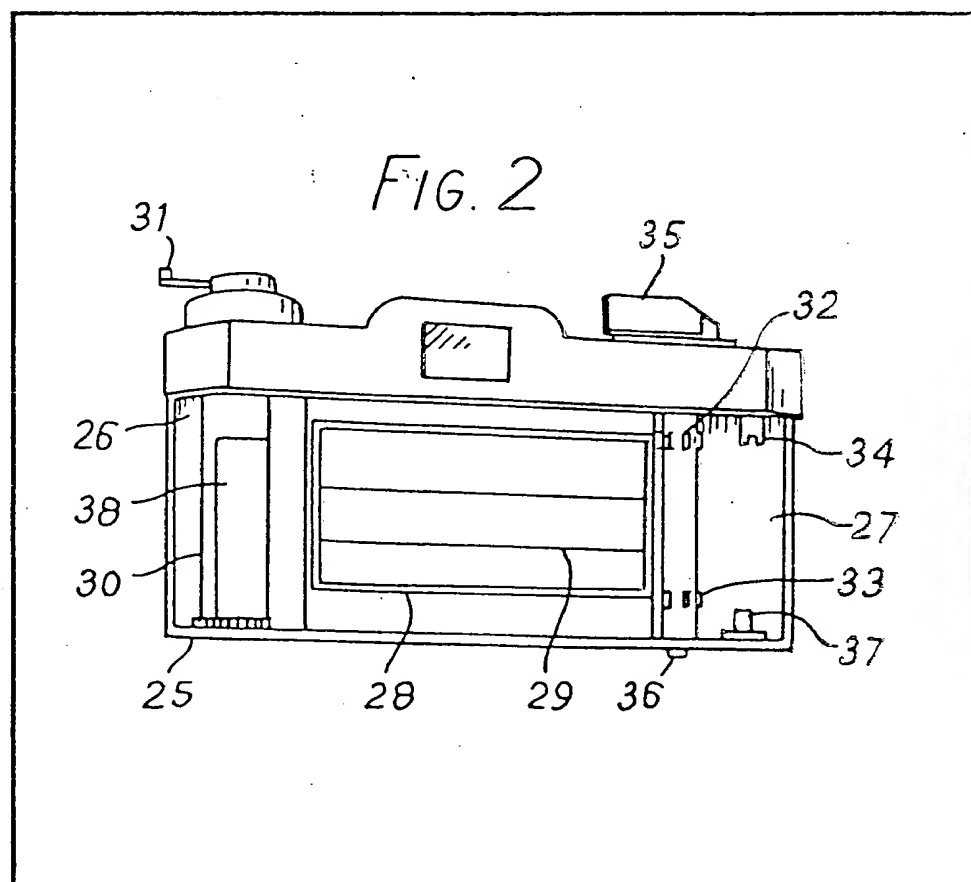


FIG. 1

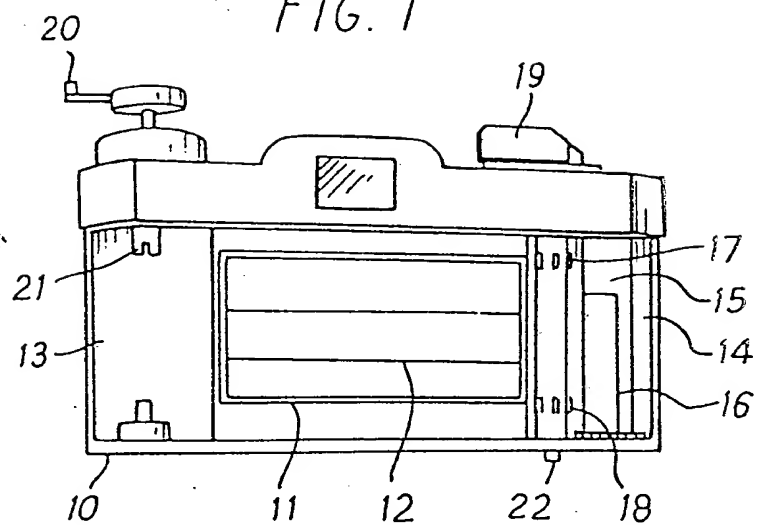
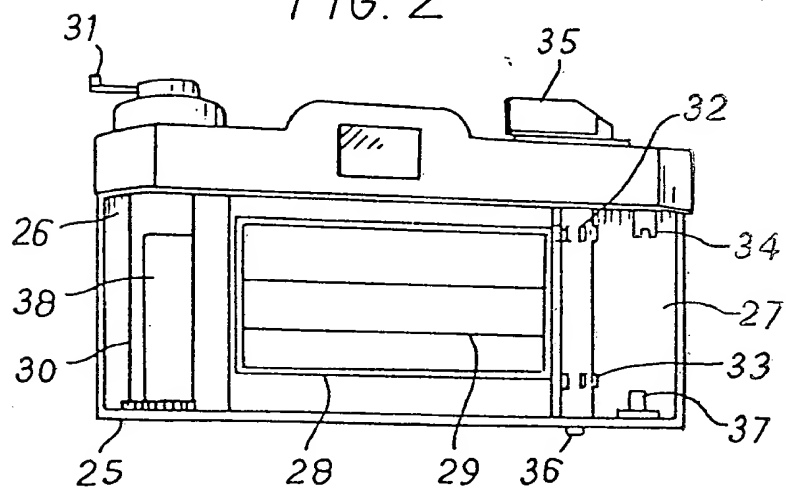


FIG. 2



## SPECIFICATION

## Process for conveying film in photographic cameras

This invention relates to a process for forward and reverse conveyance of roll film in photographic cameras with an exposure position between the winding on chamber and the storage chamber.

In photographic cameras, it is customary for exposure purposes, initially to convey the film which is protected against the light and wound up in cartridges gradually from the film cartridge though the exposure position into the film take-up chamber, and then wind the completely exposed film by means of a re-winding device from the take-up chamber back into the cartridge. With premature unintentional opening of the back wall of the camera, there is the risk of the already exposed section of film becoming spoilt because of the entry of light. As long as a sufficiently large camera housing is available, the photographer is assisted by additionally inserting into the take-up chamber an empty cartridge, into which the exposed film is rolled up.

However, in the case of a compact camera construction no camera space is available for inserting a second cartridge.

An object of the invention is to produce a new forward and reverse conveyance of the roll film in photographic cameras in order to prevent the unintentional lighting of photographic exposures.

According to the invention there is provided a method of manipulating roll film supplied in a cartridge in a photographic camera having a film gate, a first chamber to one side thereof for receiving the cartridge and a second chamber arranged to the other side of the film gate and containing a spool, comprising opening the camera, inserting the cartridge containing the unexposed film into the first chamber, closing the camera, conveying the unexposed film on its entirety from the cartridge onto the spool in the second chamber, but without being detached from the spool core of the cartridge, and for the purpose of picture taking conveying said film step-by-step through said film gate back into said cartridge as the picture exposures are made, whereafter the cartridge containing the exposed film can be removed after the camera has been opened. By this method, it is ensured that photographic exposures fixed on the film are protected against exposure to light in the single film cartridge, without any additional blocking devices to prevent unintentional opening of the back wall of the camera and without the additional insertion of an empty film cartridge into the take-up chamber.

The method is achieved by providing a camera having a shutter and shutter cocking mechanisms, the provision of a housing hav-

ing a film gate, a first cartridge chamber for receiving a film arranged on one side of the film gate and a second chamber, arranged on the other side of said film gate, a spool rotatably mounted in said second chamber, winding mechanism for effecting continuous winding of the film from the cartridge onto said spool, film transport mechanism including means for engaging the core of said film cartridge for effecting step-by-step movement of said film from said spool into said cartridge, said film transport mechanism being mechanically coupled to said shutter cocking mechanism, and a release mechanism to effect disengagement of said film transport mechanism when said winding mechanism is being operated to effect winding of the film from the cartridge to the spool.

In the accompanying drawings:

*Figure 1* shows a rear view of a known camera with the rear wall of the housing removed, and

*Figure 2* shows a rear view of the camera according to the present invention also with the rear wall of the housing removed.

The camera shown in Fig. 1 comprises a housing 10 having a film gate 11 closed by a shutter blade 12 and two chambers 13 and 14. The chamber 13 receives the film cartridge (not shown) and the chamber 14 contains a spool 15 having the usual means 16 for securing the end of the film to the spool 15.

As is known the film is drawn across the film gate step-by-step by means of a film transport mechanism comprising sprockets 17, 18. A gearing (not shown) couples the sprockets 17, 18 and the spool 15 with the manually operable lever 19 which spring-returned. After exposure of the whole film the latter is removed into the cartridge by means of a re-wind handle 20 connected to a driving shaft 21 which can be withdrawn axially to permit removal of the cartridge. During removal a rod 22 is depressed to disengage the transport mechanism.

The camera of the present invention shown in Fig. 2 employs similar parts to those of known cameras and therefore need not be described in detail. However, they are arranged differently. The camera housing 25 is again provided with two chambers 26, 27 arranged to each side of the film gate 28 closed by shutter blades 29. The chamber 26 contains a spool 30 which is connected to a handle 31 (similar to the re-wind handle of Fig. 1). The chamber 27 is adapted to receive the film cartridge (not shown). A film transport mechanism comprises the sprockets 32, 33 and a driving shaft 34 coupled via the usual gearing (not shown) to a spring-returned handle 35 which serves to cock the camera shutter and to shift the film by one frame on actuation thereof. Release means within the gearing are actuated by a shaft 36 which is

movable axially within the hub of the sprockets 32, 33. The driving shaft 34 or a spigot 37 may be axially movable to facilitate withdrawal and loading of the cartridge in the camera.

By virtue of the above described camera construction, the cartridge containing the unexposed film is inserted into the storage chamber 27 of the camera. After the end of the film has been connected to the winding on spool (by a clip element 38) the back wall of the camera is closed. Then, by rotating the spool 30, the unexposed film is taken up entirely, the other end of the film remaining attached to the spool core of the cartridge. The ready-for-use position of the camera is thereby obtained. The step-by-step exposure of the film now takes place as pictures are taken and by rotation of the spool core of the cartridge by means of the film transport device actuated by the handle 35, the film is gradually conveyed from the winding on chamber through the exposure position (film gate 28) back into the cartridge. Any unintentional opening of the back wall of the camera merely results in the exposure of the part of the film not yet exposed, whilst the photographic exposures which are already on the film lie protected against the light in the cartridge.

#### CLAIMS

1. A method of manipulating roll film supplied in a cartridge in a photographic camera having a film gate, a first chamber to one side thereof for receiving the cartridge and a second chamber arranged to the other side of the film gate and containing a spool, comprising opening the camera, inserting the cartridge containing the unexposed film into the first chamber, closing the camera, conveying the unexposed film in its entirety from the cartridge onto the spool in the second chamber, but without being detached from the spool core of the cartridge, and for the purpose of picture taking conveying said film step-by-step through said film gate back into said cartridge as picture exposures are made, whereafter the cartridge containing the exposed film can be removed after the camera has been opened.

2. A photographic camera having a shutter and shutter cocking mechanism, a housing having a film gate, a first cartridge chamber for receiving a film arranged on one side of the film gate and a second chamber arranged on the other side of said film gate, a spool rotatably mounted in said second chamber, winding mechanism for effecting continuous winding of the film from the cartridge onto said spool, film transport mechanism including means for engaging the core of said film cartridge for effecting step-by-step movement of said film from said spool into said cartridge, said film transport mechanism being mechanically coupled to said shutter cocking

mechanism, and a release mechanism to effect disengagement of said film transport mechanism when said winding mechanism is being operated to effect winding of the film from the cartridge to the spool.

3. A method as claimed in claim 1 substantially as described herein.

4. A photographic camera substantially as described with reference to Fig. 2 of the accompanying drawings.

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